



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2023-0653; Project Identifier AD-2023-00280-E]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for all CFM International, S.A. (CFM) LEAP-1A23, LEAP-1A24, LEAP-1A24E1, LEAP-1A26, LEAP-1A26CJ, LEAP-1A26E1, LEAP-1A29, LEAP-1A29CJ, LEAP-1A30, LEAP-1A32, LEAP-1A33, LEAP-1A33B2, and LEAP-1A35A (LEAP-1A) model turbofan engines. This proposed AD was prompted by a manufacturer investigation that revealed that certain high-pressure turbine (HPT) rotor stage 1 disks (HPT stage 1 disks), forward outer seals, and stages 6-10 compressor rotor spools were manufactured from material suspected to have reduced material properties due to iron inclusion. This proposed AD would require replacement of certain HPT stage 1 disks, forward outer seals, and stages 6-10 compressor rotor spools. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to [regulations.gov](https://www.regulations.gov). Follow the instructions for submitting comments.
- Fax: (202) 493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) by searching for and locating Docket No. FAA-2023-0653; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

Material Incorporated by Reference:

- For service information identified in this NPRM, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: fleetsupport@ge.com.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

FOR FURTHER INFORMATION CONTACT: Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7743; email: Mehdi.Lamnyi@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2023-0653; Project Identifier AD-2023-00280-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

The FAA has been informed that CFM has done some outreach with affected operators regarding the proposed corrective actions for this unsafe condition. As a result, affected operators are already aware of the proposed corrective actions and, in some cases, have already begun planning for replacement of certain HPT stage 1 disks, forward

outer seals, and stages 6-10 compressor rotor spools. Therefore, the FAA has determined that a 30-day comment period is appropriate given the particular circumstances related to the proposed correction of this unsafe condition.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as "PROPIN." The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA was notified by the manufacturer of the detection of iron inclusion in three non-LEAP-1A HPT rotor disks. Further investigation by the manufacturer determined that the iron inclusion is attributed to deficiencies in the manufacturing process. The investigation by the manufacturer also determined that certain CFM LEAP-1A HPT stage 1 disks, forward outer seals, and stages 6-10 compressor rotor spools manufactured using the same process may have reduced material properties and a lower fatigue life capability due to iron inclusion, which may cause premature fracture and subsequent uncontained failure of certain HPT stage 1 disks, forward outer seals, and

stages 6-10 compressor rotor spools. This condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the aircraft.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Related Service Information under 1 CFR Part 51

The FAA reviewed the following service information issued by CFM, which identify the part numbers and serial numbers of HPT stage 1 disks, forward outer seals, and stages 6-10 compressor rotor spools with potentially reduced material properties and specify procedures for replacement of these parts. These documents are distinct since they apply to different engine serial numbers.

- Service Bulletin LEAP-1A-72-00-0470-01A-930A-D, Issue 003, dated March 3, 2023.
- Service Bulletin LEAP-1A-72-00-0493-01A-930A-D, Issue 002, dated November 17, 2022.
- Service Bulletin LEAP-1A-72-00-0496-01A-930A-D, Issue 001, dated March 7, 2023.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Proposed AD Requirements in this NPRM

This proposed AD would require replacement of certain HPT stage 1 disks, forward outer seals, and stages 6-10 compressor rotor spools. This proposed AD would also prohibit installation of an HPT stage 1 disk, forward outer seal, or stages 6-10 compressor rotor spool that has a part number and serial number identified in the service information onto any engine.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 38 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Replace HPT stage 1 disk (38 affected parts)	8 work-hours x \$85 per hour = \$680	\$215,635 (pro-rated)	\$216,315	\$8,219,970
Replace forward outer seal (24 affected parts)	8 work-hours x \$85 per hour = \$680	\$47,500 (pro-rated)	\$48,180	\$1,156,320
Replace stages 6-10 compressor rotor spool (15 affected parts)	8 work-hours x \$85 per hour = \$680	\$37,660 (pro-rated)	\$38,340	\$575,100

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

(1) Is not a “significant regulatory action” under Executive Order 12866,

(2) Would not affect intrastate aviation in Alaska, and

(3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

CFM International, S.A.: Docket No. FAA-2023-0653; Project Identifier AD-2023-00280-E.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to CFM International, S.A. (CFM) LEAP-1A23, LEAP-1A24, LEAP-1A24E1, LEAP-1A26, LEAP-1A26CJ, LEAP-1A26E1, LEAP-1A29, LEAP-1A29CJ, LEAP-1A30, LEAP-1A32, LEAP-1A33, LEAP-1A33B2, and LEAP-1A35A model turbofan engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section; 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by a manufacturer investigation that revealed that certain HPT stage 1 disks, forward outer seals, and stages 6-10 compressor rotor spools were manufactured from material suspected to have reduced material properties due to iron inclusion. The FAA is issuing this AD to prevent fracture and subsequent uncontained failure of certain high-pressure turbine (HPT) stage 1 disks, forward outer seals, and stages 6-10 compressor rotor spools. The unsafe condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the aircraft.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For engines with an installed HPT stage 1 disk, forward outer seal, or stages 6-10 compressor rotor spool having a part number (P/N) and serial number (S/N) identified in Compliance, paragraph 3.E., Tables 1 through 9, of CFM Service Bulletin (SB) LEAP-1A-72-00-0496-01A-930A-D, Issue 001, dated March 7, 2023 (CFM SB LEAP-1A-72-00-0496-01A-930A-D): At the next piece-part exposure of the HPT stage 1 disk, forward outer seal, or stages 6-10 compressor rotor spool, as applicable, or before exceeding the applicable cycles since new (CSN) threshold identified in Compliance, paragraph 3.E., Tables 1 through 9, of CFM SB LEAP-1A-72-00-0496-01A-930A-D, whichever occurs first after the effective date of this AD; or if the applicable CSN threshold has been exceeded as of the effective date of this AD, within 50 flight cycles (FCs) from the effective date of this AD; remove the HPT stage 1 disk, forward outer seal, or stages 6-10 compressor rotor spool, as applicable, from service and replace with a part eligible for installation.

(2) For engines with an installed forward outer seal having a P/N and S/N identified in Compliance, paragraph 3.E., Tables 1 through 2, of CFM SB LEAP-1A-72-00-0470-01A-930A-D, Issue 003, dated March 3, 2023 (CFM SB LEAP-1A-72-00-0470-

01A-930A-D): At the next piece-part exposure of the forward outer seal, or before exceeding the applicable CSN threshold identified in Compliance, paragraph 3.E., Tables 1 through 2, of CFM SB LEAP-1A-72-00-0470-01A-930A-D, whichever occurs first after the effective date of this AD; or if the applicable CSN threshold has been exceeded as of the effective date of this AD, within 50 FCs from the effective date of this AD; remove the forward outer seal from service and replace with a part eligible for installation.

(3) For engines with an installed HPT stage 1 disk having a P/N and S/N identified in Compliance, paragraph 3.E., Tables 1 through 2, of CFM SB LEAP-1A-72-00-0493-01A-930A-D, Issue 002, dated November 17, 2022 (CFM SB LEAP-1A-72-00-0493-01A-930A-D): At the next piece-part exposure of the HPT stage 1 disk, or before exceeding the applicable CSN threshold identified in Compliance, paragraph 3.E., Tables 1 through 2, of CFM SB LEAP-1A-72-00-0493-01A-930A-D, whichever occurs first after the effective date of this AD; or if the applicable CSN threshold has been exceeded as of the effective date of this AD, within 50 FCs from the effective date of this AD; remove the HPT stage 1 disk from service and replace with a part eligible for installation.

(h) Definition

For the purpose of this AD, a “part eligible for installation” is an HPT stage 1 disk, forward outer seal, or stages 6-10 compressor rotor spool that does not have a P/N and S/N identified in the service information listed in paragraphs (g)(1) through (3) of this AD.

(i) Installation Prohibition

After the effective date of this AD, do not install an HPT stage 1 disk, forward outer seal, or stages 6-10 compressor rotor spool that has a P/N and S/N identified in the service information listed in paragraphs (g)(1) through (3) of this AD on any engine.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards

District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k) of this AD and email to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Related Information

For more information about this AD, contact Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7743; email: Mehdi.Lamnyi@faa.gov.

(l) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) CFM International, S.A. Service Bulletin LEAP-1A-72-00-0470-01A-930A-D, Issue 003, dated March 3, 2023.

(ii) CFM International, S.A. Service Bulletin LEAP-1A-72-00-0493-01A-930A-D, Issue 002, dated November 17, 2022.

(iii) CFM International, S.A. Service Bulletin LEAP-1A-72-00-0496-01A-930A-D, Issue 001, dated March 7, 2023.

(3) For service information identified in this AD, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: fleetsupport@ge.com.

(4) You may view this service information at FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on March 17, 2023.

Christina Underwood, Acting Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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